

WHAT IS CLAIMED IS:

- 1        1.        An ink jet recording apparatus, comprising:  
2                a recording head including a nozzle orifice communicated with a  
3        pressure generating chamber;  
4                a pressure generator, which varies pressure of ink in the pressure  
5        generating chamber; and  
6                a controller, which drives the pressure generator to eject ink droplets  
7        from the nozzle orifice such that a plurality of flushing operations are  
8        intermittently repeated with a first time interval, when a recording operation of  
9        the recording head is not performed, each flushing operation including a  
10       plurality of ink ejections repeated for a predetermined times with a second time  
11       interval which is shorter than the first time interval.
- 1       2.        The ink jet recording apparatus as set forth in claim 1, wherein an  
2       ejection frequency in a final flushing operation is higher than an ejection  
3       frequency in an initial flushing operation.
- 1       3.        The flushing control method as set forth in claim 2, wherein an  
2       ejection frequency in a latter flushing operation is higher than an ejection  
3       frequency in a former flushing operation.
- 1       4.        The flushing control method as set forth in claim 1, wherein the  
2       repeated number of ink ejection in a final flushing operation is greater than the  
3       repeated number of ink ejection in an initial flushing operation.

1        5.        The flushing control method as set forth in claim 4, wherein the  
2        repeated number of ink ejection in a latter flushing operation is greater than the  
3        repeated number of ink ejection in a former flushing operation.

1        6.        The ink jet recording apparatus as set forth in claim 1, wherein the  
2        controller drives the pressure generator to vibrate a meniscus of ink in the  
3        nozzle orifice between the respective flushing operations.

1        7.        The ink jet recording apparatus as set forth in claim 6, wherein the  
2        meniscus of ink is vibrated such an extent that an ink droplet is not ejected  
3        from the nozzle orifice.

1        8.        The ink jet recording apparatus as set forth in claim 6, wherein the  
2        pressure generator is driven at the maximum driving frequency thereof to  
3        vibrate the meniscus of ink.

1        9.        The ink jet recording apparatus as set forth in claim 1, the controller  
2        drives the pressure generator to vibrate a meniscus of ink in the nozzle orifice  
3        before an initial flushing operation is performed.

1        10.       The ink jet recording apparatus as set forth in claim 1, wherein:  
2               the recording head performs the recording operation while moving in  
3               a main scanning direction; and  
4               the flushing operations are performed when the recording head is in a

5 stand-by state which is defined as a time period from when the recording head  
6 stops moving to when the recording head starts moving.

1 11. The ink jet recording apparatus as set forth in claim 10, further  
2 comprising a timer, which measures a time period of the stand-by state,  
3 wherein the repeated number of ink ejections in the respective  
4 flushing operation is determined in accordance with the measured stand-by  
5 time period.

1 12. The ink jet recording apparatus as set forth in claim 10, further  
2 comprising a timer, which measures a time period of the stand-by state,  
3 wherein:  
4 the controller drives the pressure generator to vibrate a meniscus of  
5 ink in the nozzle orifice; and  
6 a vibrating number is determined in accordance with the measured  
7 length of the stand-by time period.

1 13. The ink jet recording apparatus as set forth in claim 1, wherein the  
2 repeated number of ink ejection in the respective flushing operations is  
3 determined in accordance with the type of ejected ink.

1 14. The ink jet recording apparatus as set forth in claim 6, wherein a  
2 vibrating number of the pressure generator is determined in accordance with  
3 the type of ejected ink.

1     15.     The ink jet recording apparatus as set forth in claim 9, wherein a  
2     vibrating number of the pressure generator is determined in accordance with  
3     the type of ejected ink.

1     16.     The ink jet recording apparatus as set forth in claim 1, wherein the  
2     pressure generator is a piezoelectric vibrator which changes the volume of the  
3     pressure generating chamber to vary the pressure of ink therein.

1     17.     The ink jet recording apparatus as set forth in claim 1, the controller  
2     includes:

3             a drive signal generator, which generates a common drive signal  
4     including a flushing waveform configured to perform an ink ejection and a  
5     meniscus vibrating waveform configured to vibrate a meniscus of ink in the  
6     nozzle orifice; and

7             a drive waveform selector, which applies the flushing waveform and  
8     the meniscus vibrating waveform selectively to the pressure generator.